

PREHISTORIC SOUTHERN NEVADA STUDY UNITS

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The region included here as southern Nevada subsumes the Nevada portion of the Death Valley basin, and the parts of the central hydrographic region and the Colorado River basin found south of 37° latitude (Figure 1Vd-1). As such, it includes the whole of Clark County and the southernmost sections of Lincoln and Nye Counties (Division of Water Resources 1971).

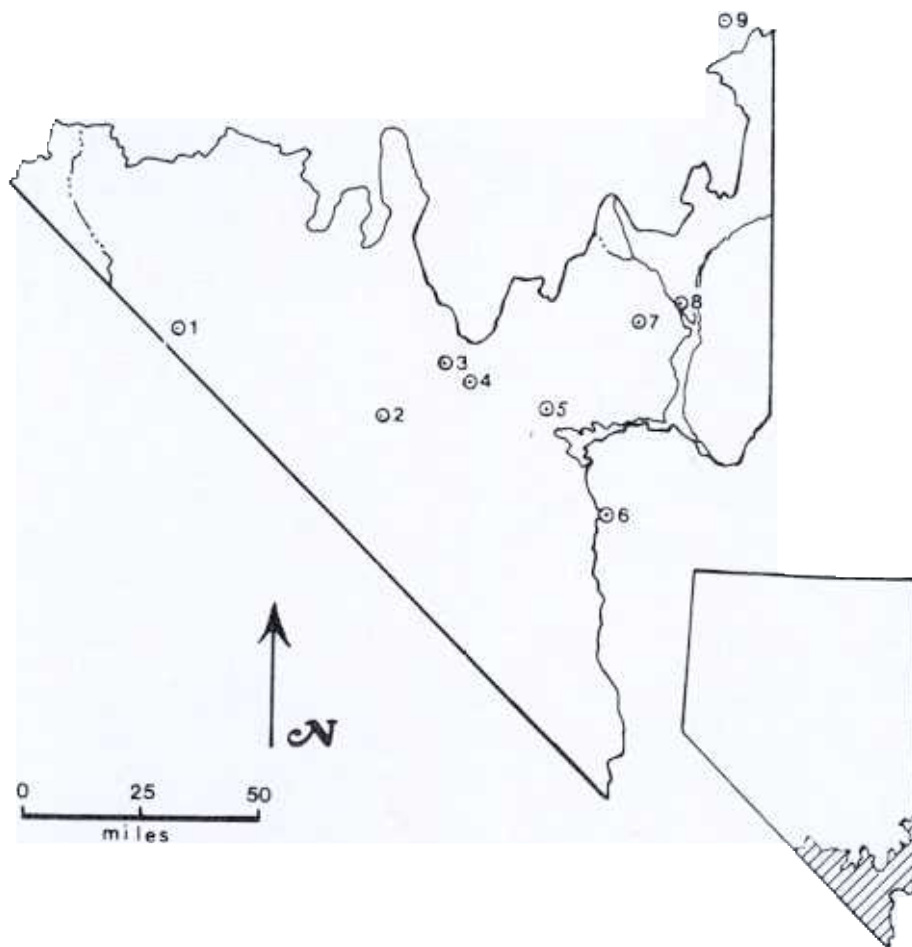
Southern Nevada differs from the area to the north in a number of respects, and the prehistoric and historic occupations reflect those differences. Although southern Nevada is part of the Basin and Range physiographic province, much of it is drained by the Colorado River, and so it is not part of the Great Basin proper. More importantly, it is not only the southernmost part of the state, but elevations of valley floors are much lower, generally 2500 ft or less, and it is significantly hotter and more arid than the rest of the state. The primary vegetation of the valley is the creosote bush community, dominated by creosote bush (Larrea divaricata) and bur-sage (Ambrosia dumosa) (Holland et al. 1979:4). The creosote bush community is widespread in the southern deserts of North America, the Sonoran, Chihuahuan and Mohave (Bradley and Deacon 1967:212). Southern Nevada is included in the Mohave Desert, while virtually all the rest of Nevada is in the Great Basin Sagebrush Desert (Jaeger 1957:123).

Several of the staple plant foods of the aboriginal populations are southern rather than northern species and contribute to the distinctiveness of southern Nevada as a human habitat. The yuccas and agaves are among these and they occur at intermediate elevations in black-brush and Joshua-tree associations. Mesquite (Prosopis glandulosa var. torreyana) and screw-bean (P. pubescens) are also southerly in their distribution. Groves of mesquite prosper along washes at low to middle altitudes. On the northern fringe of the Mohave Desert in Nevada, mesquite bears fruit only at elevations below 3100 ft (Beatley 1976:196).

At higher altitudes black-brush and Joshua-tree vegetation gives way to pinyon-juniper woodland, well developed between 4500 and 6000 ft (Holland et al. 1979:8). Pinyon-juniper woodland is widespread in the southwest (Bradley and Deacon 1967:220) and extends north into central Nevada as well. Pine nuts, the product of pinyon (Pinus monophylla), were important in aboriginal diets, and so their quantity and distribution is important in understanding prehistoric human ecology of the region. Bradley and Deacon (1967:220) point out that as a result of the "Merriam effect" many of the smaller mountain ranges of southern Nevada, although they may reach elevations of 6000 ft or

Figure IVd-1. Major archaeological localities
Southern Nevada Study Unit.

1. Ash Meadows
2. Red Rock Canyon
Corn Creek
- 4 Tule Springs
5. Gypsum Cave
6. Willow Beach
- 7 Valley of Fire
8. Pueblo Grande de Nevada
9. O'Malley Shelter



**Southern Nevada
Prehistoric Study Units**

greater, do not have pinyon-juniper woodland present.

Higher altitude woodlands are very restricted in their occurrence in southern Nevada. The fir-pine community is found only in the Spring and Sheep Ranges and the very highest elevations of the Virgin Mountains. The bristlecone pine community is limited to the Spring and Sheep Ranges at elevations above 9000 ft (Bradley and Deacon 1967:222-224).

Large game were limited to deer and the desert bighorn sheep, both of which are upland species in southern Nevada. Bighorn sheep use the upper elevations of the black-brush community, and along with mule deer are common in the pinyon-juniper zone. Both species also range higher into the fir-pine and bristlecone zones (Bradley and Deacon 1967:212-224). Antelope, which were important to aboriginal populations in northern and central Nevada were, at best, rare in southern Nevada and have not been reported in post-Pleistocene archaeological assemblages. Antilocaprid remains were recovered from several localities in Unit E₁ at Tule Springs, which dates about 13,000 years ago, however (Wormington and Ellis 1967:124).

Small animals were also important. The creosote bush community contains a variety of small rodents and small to medium carnivores, as well as jackrabbits and cottontails. While these animals also occur in other zones, several species reach their greatest abundance in the desert riparian zones (Bradley and Deacon 1967:219). Warren (1981) has pointed out that mesquite groves, which are one expression of desert riparian vegetation, are characterized by relatively large numbers of small mammals and reptiles, enriching the potential of these groves as productive locales for hunting and gathering populations. The desert tortoise, Gopherus agassizi, which is frequently found in the creosote bush and associated washes is another dietary element limited to southern Nevada.

Despite the aridity of the region, two perennial streams, both tributaries to the Colorado River, flow through southern Nevada: the Muddy and the Virgin Rivers. The alluvial soils of their floodplains and low terraces are well suited to agriculture and were brought into cultivation early in the historic period. Their agricultural potential was recognized by the prehistoric occupants of the region, and the valleys of the Muddy and Virgin shelter an enclave of Puebloan occupants, the only such occupation in Nevada. Their settlements constituted the westernmost extension of the Anasazi occupation, which was centered in the Four Corners area of the Southwest. The Virgin heads up in the high mountains of southwestern Utah, and it is a flood-prone stream, highly variable in its flow from season to season and year to year. The Muddy, which is formed from the outflow of a series of springs in the upper Moapa Valley, is a very stable water source, with consistent flow winter and summer, year in and year out, except when it is overwhelmed by flash floods from such tributaries as Meadow Valley Wash (Harrington 1930b:4) and California Wash.

HIGHLIGHTS OF ARCHAEOLOGICAL RESEARCH

Archaeological remains in southern Nevada caught the imagination of the early settlers in the area. They discerned decorated pottery and house remains, and visions of former glories fueled hopes for future development.

At the last session of the State Legislature, a memorial to Congress was adopted, asking for the immediate improvement of the Colorado River to Callville. It set forth that evidences exist that a prehistoric race, advanced in art, science and civilization once occupied the region bordering on the Colorado, from the Grand Canon to the Gulf of California, and inhabited large and regularly laid-out cities; built canals, aqueducts, highways and culverts; understood engineering, constructed systems of irrigation and drainage, and embarked extensively in mining operations (Angel 1958:489).

Governor J. G. Scrugham was responsible for bringing southern Nevada's antiquities to the attention of the scientific community. He had read reports of Pueblo pottery found in southern Nevada, and had "instructed his prospector friends in the southern part of the state to be on the watch for salt caves and extensive ruins" (Harrington 1930b:16). John and Fay Perkins, of St. Thomas and Overton respectively, reported the Puebloan remains of the Moapa Valley to Scrugham, and Scrugham invited M. R. Harrington to accompany him on a reconnaissance trip in October of 1924. Harrington, affiliated with the Heye Foundation of the Museum of the American Indian, had been working with Loud at Lovelock Cave, but by November 1924, he had "a full-fledged operation . . . on the ground" (Harrington 1925:14). Harrington began his Lost City work at the Main Ridge locality (Lyneis 1980:4). He worked in the Moapa Valley until 1930, and then at Gypsum Cave. When Lake Mead threatened the Puebloan occupation, he returned to Lost City under an agreement with the National Park Service to direct additional excavations, using CCC labor (Simpson 1965:18). Although excavations continued until 1941, after 1935 he acted as a consultant (Kirkberg 1980:13-15). Mesa House (Hayden 1930) was excavated in 1929 under the auspices of the Southwest Museum (Harrington 1930b:21). Harrington also provided general supervision for Wheeler's excavations at Etna Cave (Fowler 1973:2).

Scrugham also mentioned Gypsum Cave to Harrington during that first visit to southern Nevada in 1924. It was not until 1930 that Harrington began excavations at the cave, to seek to determine the relationship of the sloth dung to human occupation. Some initial excavations were undertaken in April of 1929, however, and Scrugham's son, James G., Jr. was one of the crew. Harrington worked two seasons at the cave, completing his exploration in January 1931 (Harrington 1933:5-16).

Scrugham, now an ex-governor, is also credited with

directing Fenley Hunter and his associates who were seeking to make the first collection of Pleistocene mammalian fossils from Nevada, to Indian Springs, which led them to explore Las Vegas Wash (Harrington and Simpson 1961:43). The result was the discovery of the Tule Springs fauna and the apparent association of an obsidian flake and extinct fauna with charcoal and ashes. George Gaylord Simpson published the find (1933), but Hunter "turned his site over to the Southwest Museum for further investigation" before the article appeared (Harrington and Simpson 1961:46). Harrington's first expedition to Tule Springs was in October 1933, and he was accompanied by Fay Perkins, who had become "a long-time friend and veteran expedition assistant" through his work with Harrington at Lost City (Harrington and Simpson 1961:50).

Artifacts proved to be sparse in the Tule Springs deposit, and Harrington did not pursue his work there after 1933. In 1954, however, a sample of charcoal, including some collected by Harrington in 1933 and some of Fenley Hunter's charcoal, was submitted to Willard Libby at the University of Chicago. The resulting date was "more than 23,800 years old" (Harrington and Simpson 1961:58-59).

Excited by the possibility that Tule Springs might double the known age of man in the New World, the Southwest Museum organized expeditions to the locality in 1955 and 1956. Work at the locality was difficult due to the depth of the deposits and what Simpson described as "the toughness of the clay" (Harrington and Simpson 1961:71). They used a jeep fitted with a dozer blade and a drag to remove overburden and, in at least one case, resorted to dynamite to break up deposits overlying a stratum which they wanted to expose (Harrington and Simpson 1961:83-84). At the end of the 1956 season they recognized that a large-scale project would be necessary if evidence of definitive association of man with the early fauna was to be recovered (Harrington and Simpson 1961:71). The recovery of a scraper in association with charcoal which dated >28,000 years (Harrington and Simpson 1961:75-76) was tantalizing evidence of what still might be found there, however.

In 1962, Tule Springs was chosen as the objective of research for an Early Man project, stimulated by the interest of Libby in furthering work using radiocarbon dating in relation to archaeology. Dr. Richard Shutler of the Nevada State Museum directed the project, and it was undertaken in cooperation with the Southwest Museum. The Southwest Museum made Ruth D. Simpson, who had worked at the locality with Harrington in 1955 and 1956, available for field work for 8 weeks of the season (Wormington and Ellis 1967:3).

The 1962-63 work at Tule Springs was not only large-scale but interdisciplinary. Geological study by Vance Haynes led to the recognition of stratigraphic differences within the deposits. Units E₁ and E₂ were found to date between 7,480 and 13,100 years ago, and contained extinct fauna including camel, two species of horse, and mammoth, as well as scattered artifacts. Older

deposits were found to be >20,000 years old. They, too, contained Pleistocene fauna, but no artifacts were found (Wormington and Ellis 1967:83, 125). In the larger exposures made possible by the project, the carbonized wood which had appeared to be charcoal to earlier workers was found only in stream channels or associated with extinct springs. Further, it did not respond chemically like charcoal. It was concluded that it may be the product of decay rather than burning, so that while it provided suitable dates, it was not evidence of hearths or human activity (Wormington and Ellis 1967:66).

Richard Shutler's interest in Nevada predated his appointment as Curator of Anthropology at the Nevada State Museum. Shutler undertook archaeological survey in the area in 1955, and then prepared and published an analysis and summary of the Lost City materials that had been excavated in the 1920s and 1930s (Shutler 1961). He also published surveys of Valley of Fire and Red Rock, undertaken for the Nevada State Parks Commission (Shutler and Shutler 1962), and the results of excavation of Stuart Rockshelter (Shutler et al. 1960).

In 1966 a branch of the Nevada Archaeological Survey was established in Las Vegas, administered by the Desert Research Institute, with Richard Brooks as Director. That development, along with archaeological programs carried out by the Department of Anthropology, University of Nevada, Las Vegas once Claude N. Warren joined the faculty in 1969, has resulted in a number of small and medium scale archaeological projects. Much of it has been survey and testing, or excavation for management purposes, and has resulted in numerous reports and several M.A. theses. Recently, the Departments of Anthropology and History initiated a joint program of historical archaeology which has focused on southern Nevada, and particularly on Mormon pioneer sites.

ARCHAIC STUDY UNIT

The Archaic in southern Nevada spans the period between occupations associated with late Pleistocene fauna or lacustrine and riverine features of that period, and the advent of the Anasazi. It dates from about 6000 B.C. to perhaps A.D. 500. Lasting for almost 7000 years, it comprises a substantial portion of southern Nevada's prehistoric period. For these 7000 years, southern Nevada was populated by hunting and gathering people, and we have much to learn about cultural developments during this long span of time. The major question for research regarding this period is, "Are there large-scale directional trends and changes that characterize this period?" Anthropological views of hunter-gatherers characterize them as responding to, or reacting to, environmental change and environmental variability with flexible subsistence strategies. There is much evidence and theory to support this as a generally appropriate characterization of synchronic adaptations across a varied environment such as the

southern Great Basin. Flexible subsistence strategies also may account for short term changes, in that they enable a population to accommodate itself to year-to-year fluctuations in the availability of plant and animal foods. In the longer run, however, human societies have experienced progressive cultural evolution, of which the changes from hunter-gatherers to agriculturalists, and the development of urbanized and then industrialized societies, are the hallmarks. When we focus on 7000 years of hunting and gathering, the changes must be of lesser magnitude, but that does not mean that they are simply responsive or reactionary readjustments which do not contribute to directional change. Yet archaeologists have treated the Great Basin Archaic as a period without major developments. This is the result of two factors: 1) according time depth to models developed on synchronic, often ethnographic, data; and 2) limitations in our ability to discern fine-grained changes in the archaeological record. The apparent flatness of the Archaic is a product of current archaeological methodology and is not an accurate characterization of the development of the Archaic societies.

The question of the presence or absence of large-scale directional trends in the southern Nevada Archaic takes us to the heart of man's sociocultural capacity to adapt to semi-arid environments with hunting and gathering technology. Directional trends which may be present during the Archaic include decreasing mobility, increasing population density, increasing community size, technological change, diversification or specialization of food resource utilization, and increasing economic interaction between communities.

Environmental Change

The nature of changing adaptation to the environment is a central issue in this research orientation, and environmental change becomes a key variable in understanding the region's prehistory. We need to know the magnitude of short-term climatic fluctuations and of long-term climatic change in the region. We also need to be able to translate climatic changes into their effect on the quantities and reliability of plant and animal foods.

Fossil packrat middens provide useful, datable plant macrofossils from this period, although they have yet to provide a continuous sequence from any area. They show that the establishment of the desert scrub vegetation of the lower altitudes in the region was not a simultaneous event, but was completed in some areas of the Mohave Desert by 7800 B.P. In other areas it did not develop until later, perhaps as late as 2500 B.P. (Spaulding n.d.:91). The area is also astride the location of the secondary summer precipitation maximum associated with moist maritime air from the Gulf of California. The location of this boundary, which has shifted in Holocene times, is important in its control of the lower elevational limit of pinyon, one of

the staples of the Mojave Desert. Spaulding points out that "In the Sheep Range, the lower limit of pinyon-juniper woodland fluctuated more than 100 m during the last 5000 years" (n.d.:92). Fluctuations of this magnitude would substantially effect the quantity of pine nuts available in the mountain ranges where pinyon was present. It is evident that there are significant environmental changes during the Archaic, and it is our task to delineate the character of those changes and their effects on food sources, so that we can delineate the responsive trends in the archaeological record, and then search for longer term, directional changes in the adaptive capacity of the sequential Archaic societies.

Pollen records for Archaic are spotty, and as yet we have no good continuous sequence for the area. Those available include the late Pleistocene to early Holocene record from Tule Springs (Mehring 1967), Ash Meadows (Mehring and Warren 1976) and O'Malley Shelter (Madsen 1973). Weide (1981) has recently discussed environmental and climatic change in the southern Great Basin, including southern Nevada. He characterizes climatic change during the past 8000 years as short-term fluctuations, "an apparent cycle of minor droughts lasting from 5 to 30 years recurring at intervals of 200-250 years."

Chronology

The southern Nevada Archaic is characterized by a sequence of projectile point types which constitute the only identified time-sensitive artifact forms from this period. There is general agreement on the sequence of Pinto, Gypsum and Amargosa points in the area, from earlier to later, a series shared with the California portion of the eastern Mohave. The latest portion of the Archaic of southern Nevada is designated herein as Amargosa rather than "Elko," although the latter term has been more frequent in the recent literature. Elko implies both that the points of this period are stylistically the same as a series of points from northern Nevada, and that the southern points are contemporaneous with the northern ones, and so they are assumed to mark a similar time period. "Elko" also emphasizes assumed cultural relationships to the north, deemphasizing relationships to the east, which are at least as important. In fact, the Elko series of points is a composite of several varieties, and the dating of the varieties is uncertain even in the northern Great Basin. Extension of this term into southern Nevada has contributed confusion rather than clarification to the region's chronological problems. Substitution of the term Amargosa, used in the sense of Amargosa I as described by Rogers (1939:62-64), for Elko emphasizes the Mojave Desert affinity of the late Archaic material in southern Nevada and reopens the questions of stylistic and chronological relationships to complexes outside the Great Basin.

There is little consensus on the dating of Pinto, Gypsum and Amargosa points or the extent to which each of them either

characterizes a discrete time span or overlaps with the span of the others. Most serious is the lack of good dating within the Mohave Desert of the Pinto series, which is the oldest. Some researchers, such as Wallace (1978), date it to after 3000 B.C. and say that there is a gap in the archaeological record prior to that, reflecting a period when the region was largely uninhabited. Others, such as Susia (1964), and Warren and Crabtree (1972) accept a dating for Pinto as early as 4000-5000 B.C., and with it, occupational continuity from early Holocene onwards. Behind these two interpretations of projectile point chronology lie very different models of first, the nature of climatic and environmental change; and second, the adaptive capacity of Archaic societies.

Overall, the excavation of O'Malley and Conaway Shelters provides the best sequence for the Archaic period in southern Nevada. In the O'Malley sequence, Gypsum points date about 1800 B.C., and Elko points are co-dominant with Gypsum points by about 1000 B.C. (Fowler et al. 1973:15, 23; Lyneis 1981b).

Subsistence Change

Direct evidence of diet in the form of preserved food remains or coprolites has not been recovered from Archaic contexts in southern Nevada or adjacent portions of the Mohave Desert in California. Our present sense of dietary constituents is inferred from such indirect evidence as stone tool assemblages and patterns of site location. Milling stones and mortars may have not been present at the beginning of the Archaic (Lyneis 1981b), but they are important by the end. Upland sites were more frequently used in the later part of the Archaic. Both of these characteristics suggest that plant foods became more important during the course of the Archaic.

We have not determined if the plant foods which were staples of the later occupants of the region were in use during portions of the Archaic in southern Nevada. Pine nuts, mesquite and yucca were important in the region. The initiation of pinyon use in central Nevada is the subject of controversy (Thomas 1980), and it has been argued that pinyon was not available in that region until relatively recently (Madsen and Berry 1975). Bettinger (1977:15) has argued that its use began relatively late in that region. In southern Nevada, pinyon was available during most, if not all, of the Archaic, although its quantity has varied. Spaulding recovered pinyon (*Pinus monophylla*) macrofossils from Sheep Mountain pack rat middens dating between 1990 B.P. and 5210 B.P. (n.d.:67), so our primary concern is with documenting its use and the extent of its contribution to the diets of the Archaic population. Mesquite has been present in southern Nevada at least since 4450 B.P. \pm 360 (Mehringer and Warren 1976:138). The presence of number of mortars in the Mesquite Flats phase in Death Valley (Wallace 1958) suggests that mesquite processing was important by about 3000 years ago. Yucca of several varieties was found in the middle and late Holocene pack rat middens in the Sheep Mountain (Spaulding n.d. 67),

and so was available during much of the Archaic.

The contribution of game to Archaic diets is also poorly documented, and has largely been inferred from projectile point quantities, site locations, and the absence of food processing tools. Wallace characterized Pinto people as hunters (1977), but others such as Susia (1964) and Warren and Crabtree (1972) have been equivocal. For the post-Pinto Archaic, we should expect variation in the overall contribution of game to the diets. In addition, the contribution of large game, primarily mountain sheep and secondarily deer, should vary in relation to small game. Just as for other foodstuffs, we need to test for long term trends in the use of game and to examine such trends for evidence of increasingly efficient food procurement or other indications of progressive change.

Settlement and Population Change

Evidence from the eastern Mohave Desert indicates that community size and location varied during the Archaic. Pinto sites are usually small with sparse assemblages, reflecting short-term use by small groups (Wallace 1977:115; Rogers 1939:48). Some Amargosa period sites in the valleys of the eastern Mojave Desert are extensive, up to several acres, and their artifact densities reflect repeated, intensive use by larger groups (Wallace 1958: 9-12; Wallace 1977:121; Rogers 1939:61). The relative mobility of communities and the extent of task specialization and localization are reflected in the variation in site assemblages left by hunting and gathering peoples. Binford has recently suggested the dichotomy of fine-grained vs. coarse-grained assemblages as a key to mobility (1980:17). He also makes the point that at least some of the kinds of sites produced by hunter-gatherers may be clearly environmentally patterned, particularly what he terms "locations" of foragers and the particular kinds of "field camps" of collectors (1980:19).

Amargosa points are much more common than earlier points in upland locations, although not in the pinyon zones (Wallace 1977: 121). This implies a broadened use of the landscape. The greater quantities of Amargosa materials in comparison to remains of earlier periods in the eastern Mohave Desert suggests a population increase as well as increased community size in the late Archaic.

Technological Change

Questions of technological change during the southern Nevada Archaic have not been addressed directly by prehistorians concerned with the area. The technology of Pinto point production distinguishes Mohave Desert Pinto points from similar forms to the north (Warren 1980:72-73). It also differs from the craftsmanship of later points such as Amargosa points (Rogers 1939:64). The nature of these differences, whether they represent a directional trend and are an improvement in technology of production, and how they relate to

changing material preference, remain to be studied

Changing projectile point styles also need to be examined in the context of large game procurement strategies. The bow and arrow was not in use during the Archaic, but there are many techniques of differing efficiency and application that may have been used in hunting with spears or atlatls, including ambushes and drives. If large game was limited to mountain sheep and small, localized deer populations during the Archaic, we would predict that hunting by small groups would be the predominant strategy.

Small game strategies are unknown. Do they include the full range of ethnographically recorded techniques, or was Archaic technology simpler, less developed? Are there changes or improvements in strategies for the capture of small game during the Archaic?

The adoption of plant food processing technology is also an important Archaic event, and has been discussed under subsistence changes.

Intercommunity Exchange and Interchange

Interaction between prehistoric communities is difficult to document, but exchange of goods and information is an important part of a community's adaptation. Perhaps the best clues to prehistoric exchange and information networks may come from the distributions of source-specific lithic materials which were of sufficient value to be exchanged. Lithic studies suited to these questions are in their infancy in Nevada, but their promise is great. The sequence from O'Malley Shelter shows a unidirectional trend of increasing use of obsidian through time, and this may reflect a broadening exchange network. The most marked increase occurs between Unit III which is dominated by Gypsum points, where obsidian constitutes 36% of the waste flakes, and Unit IV which is dominated by Elko series points and contains 55% obsidian among the waste flakes (Fowler et al. 1973:40-41).

Shell beads have not been found so frequently in Archaic contexts in southern Nevada as they have been in northern Nevada where they serve as indicators of chronology by cross-dating them to the California bead sequence as well as indicators of trans-Sierran exchange. Shell beads were recovered from Archaic deposits in O'Malley Shelter, however; three from Unit II which dates about 1970-2680 B.C., and two from Unit III, dated by a single radiocarbon measurement to about 1790 B.C. (Fowler et al. 1973:15, 54). Shell beads were traded into southern Nevada in quantities in Anasazi times, and apparently that trade had its beginnings in the Archaic. Clearly, archaeological excavations should include recovery strategies for shell beads so that we do not lose the opportunities they provide for analysis of the long-range contacts of Archaic populations, as well as the chronological control they can provide.

Late Archaic Ceremonialism

Split-twig figurines, which have been found in the Moapa Valley (Schroeder 1953b:62) and Etna Cave (Fowler 1973:27), are thought to mark the participation of southern Nevada societies in a cult system that was shared by peoples in southern Utah, northern Arizona and the Mohave Desert of southern California. These figurines are made of split willow twigs or tules, bent and wrapped to represent large, sometimes horned animals, probably deer, mountain sheep or antelope. Schroedl has argued that these figurines are associated primarily with Gypsum points and first appear prior to 1000 B.C., lasting until as late as A.D. 500. In Cowboy Cave in southeastern Utah, Schroedl's best case of association of the figurines with other cultural materials, they are associated with both Elko and Gypsum points. To the west in Newberry Cave, southeast of Barstow, California, split-twig figurines have also been found in association with Elko series and Gypsum points. Davis (1981:104) interprets Newberry Cave as a place for magico-religious activities involving the figurines and other objects used by a hunting cult. Seven radiocarbon measurements date the Newberry assemblage, and Davis interprets them to provide a date of about 1500 B.C. for the split-twig figurine cult in Newberry Cave (1981:94, 104). Fowler et al. (1973:81) suggested that "Gypsum points were a southern Great Basin development." Although we now know that these points were also important in southeastern Utah, Gypsum points and split-twig figurines both indicate that the relationships of the late Archaic societies in southern Nevada were not primarily with those of the north of them, but instead reached into the California desert to the west and the Colorado Plateau to the east.

Some of southern Nevada's rock art dates to the Archaic period. Mountain sheep are often shown in the patinated panels, perhaps linking them to the pursuit of this wary game. The geography of mountain sheep depiction in rock art does not accord with the distribution of the split-twig figurines. Instead, it is much more widespread, reaching throughout Nevada, Utah, and into eastern Oregon and Washington. Rock art from the Archaic is identified by the style of the renderings; the depiction of atlatls, which were the primary weapon of the Archaic hunters; superposition of more recent figures on older ones; and the relative degree of weathering in comparison with more recent, fresher figures on the same rock. Campbell Grant et al. (1968) applied these methods to the rock art of the Coso Range in California, and a generally similar sequence can be discerned in southern Nevada. Here the Archaic is truncated by the Anasazi occupation, and the Puebloan rock art is distinctive, differing from the earlier and later depiction in both design style and elements, as Schaafsma (1971) recognized. As a result, the rock art of southern Nevada is particularly suited to study because the outlines of the chronological sequence are intelligible.

Arnie Cunningham (1978) took advantage of this temporal control for rock art in southern Nevada to study two sites in the

southern portion of Red Rock Canyon where there was evidence of occupation in association with panels of rock art. Both sites span the period from about 1000 B.C. to A.D. 600, and one of them continued in use until the historic period. Their artifactual assemblages reflect differences in the activities that were carried out at the two sites; Cunningham interpreted differences in their petroglyph assemblages as also indicating the functional differences of the two sites. She then argued that the petroglyph assemblages can be studied as a part of the whole site assemblage, and that "petroglyph elements are not random 'doodling' but are in fact indicative of specific patterned behavior" (Cunningham 1978:85-86).

Cunningham also identified continuity in the figures depicted during the period 1000 B.C. to contact and argued, as did Grant et al. (1968) for the Coso Range, that this cultural continuity indicated a much greater time depth for Shoshoneans in southern Nevada than has been accorded them by hypotheses based on reconstructed linguistic history. Cunningham proposed that Shoshonean speakers were present in southern Nevada by 1000 B.C., making them the late Archaic population of the region, as well as the contemporaries of the Anasazi and the people of the region in the post-Anasazi period.

Table 1Vd-1 identifies key research questions which pertain to the southern Nevada Archaic Study Unit.

Kinds of Sites

The Archaic peoples were non-sedentary hunters and gatherers, and so left a scanty and dispersed archaeological record. Variations and changes surely characterized their development, but they are variations on the themes of relative mobility and small group size. Small groups that move frequently leave modest debris scatters from which the organic remains and other perishable items quickly disappear. Deetz (1968:285) suggested that past hunters and gatherers who were characterized by small community size and considerable mobility might be archaeologically "invisible". Surely the Archaic period inhabitants of southern Nevada are close to that threshold. Visibility is not solely the product of the size of the object for which we search, however. It is equally affected by how hard one looks, and how strong a magnifying glass we use.

The Archaic is largely imperceptible or overlooked in cultural resource surveys. It obtrudes only when an identifiable projectile point of an Archaic type is found, for we have few characteristics to guide us in identifying the other constituents of Archaic assemblages. Archaeologists have developed methods of lithic analysis to identify patterns of technological productions and use wear for functional interpretations. Spatial analysis helps us to discover the orderly and patterned arrangements within a surface scatter of lithics. These techniques are the lense through which the Archaic can become visible. It is a challenging and laborious kind of archaeology, highly demanding of analytic time and skills.

Table IVd-1. Key Research Questions,
Southern Nevada Archaic Study Unit.

CHRONOLOGY

1. What is the chronology of the cultural sequence?
What projectile points are good time markers within the region, and what is their time span?
2. What other kinds of time markers are there in the region that can be used to seriate surface assemblages? Are there time-significant changes in the patterns of lithic technology? Choice of lithic materials? Morphology of other stone tool types than projectile points?

ENVIRONMENTAL CHANGE

1. What are the magnitude and chronology of climatic and environmental shifts during the Archaic? What were their effects on the Archaic peoples?

EVOLUTIONARY CHANGE

1. Are there long term directional trends reflecting progressive change in the record of variability in
 - a. settlement patterns?
 - b. community size?
 - c. population density and distribution?
 - d. assemblage composition?
 - e. technological change?
 - f. intercommunity exchange?
 - g. ritual/ceremonial systems?
-

Although many characteristics of the archaeological record of hunters and gatherers make their prehistory difficult to discern and interpret, their highly mobile patterns also contribute a modest advantage. Binford (1980) has designated one of the strategies of food procurement employed by hunters and gatherers as "foraging", wherein the group moves to the locality of the resource and there harvests, processes, and often consumes it, often remaining only a day or two. He contrasts this with "collecting", in which the group organizes sub-groups which travel out to resource patches, collect the foods and bring them back to the larger group for much of the processing, storage and consumption. The foraging pattern, although it results in low density, small archaeological sites, includes the debris and by-products of a restricted set of tasks. Further, the site is close to the particular resources that were sought, and so the relationship of the site to its immediate surroundings provides maximal clues to the resources sought. This kind of inferential information is invaluable to an archaeologist when direct evidence of foodstuffs have long perished. Binford characterizes the assemblages that result from such mobile foraging as "fine-grained" in comparison to the "coarse-grained" assemblages which are composite residues of the many activities which are carried out at residential sites by less mobile peoples.

The archaeology of the Archaic is largely the study of that frustrating site category, the lithic scatter. The invisibility of the Archaic results from archaeological techniques and the need for economy in archaeological surveys. It is not that archaeologists cannot see lithic scatters. Identification of them as Archaic is difficult, but the larger problem is the implicit decision inherent in most guidelines that the cost of recording, collecting and analyzing the contents of lithic scatters is too high for the information that might result. So, without a single study of a scale sufficient to learn how much information, in what circumstances, may reside in these small surficial sites, they are relinquished one by one, and with them goes the archaeology of the Archaic.

As Richard Hanes has argued in the Central Nevada Study Unit, large scale pilot studies of the archaeology of lithic scatters are a high-priority management need. Without them, agencies are making uninformed decisions that delete a portion of the archaeological record, a portion that is of great importance to the Archaic period.

Table 1Vd-2 lists the kinds of sites which characterize the Archaic of southern Nevada, and the condition they should be in if they are to produce important information. Table 1Vd-3 summarizes management needs that relate to the study unit.

ANASAZI STUDY UNIT

The valleys of the Muddy and Virgin Rivers were occupied by a population whose cultural affinities were with the Anasazi of

Table IVd-2. Kinds of Sites and Conditions,
Southern Nevada Archaic Study Unit.

-
1. Sites which provide chronologically controlled assemblages,
as:
 - stratified open sites with Archaic layers
 - rockshelters with stratified Archaic deposits.
 2. Stratified sites, either open or protected, which have Archaic deposits are extraordinarily important if they have preserved food remains, either plant or animal foods.
 3. Sites, with or without archaeological remains, that provide chronologically controlled environmental data such as pollen sequences or faunas of the Archaic period.
 4. Single component surface sites from small to large on surfaces of sufficient stability to indicate that spatial patterning relating to prehistoric activities may still be present.
 5. Rock art sites with patinated panels, designs of the Great Basin Abstract and Curvilinear styles, or depictions of the atl-atl.
-

Table IVd-3. Management Needs,
Southern Nevada Archaic Study Unit

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1. Field inventory directed to the location and identification of Archaic sites, designed to test for changes in settlement systems, and to record and collect a sample of assemblages for lithic and spatial analysis.
 2. Study of results of field inventories to identify appropriate methodologies for handling of lithic surface sites in future management.
 3. Accord high priority protection to sites which may have stratified deposits of Archaic age, whether in rockshelters, caves, or open sites.
-

adjacent northern Arizona and southern Utah from about A.D. 1-1150. Although neither their arrival nor their departure has been closely dated in the region, both their advent and their disappearance form cultural discontinuities in the prehistoric record.

It was the remains of this occupation - the houses; the decorated, well-made pottery; and the salt mines - that first attracted outside interest in the archaeology of southern Nevada. Although dwarfed in scale if compared to cliff dwellings at Mesa Verde or other more spectacular Anasazi remains in Arizona and Colorado, they rank high among Nevada's prehistoric remains for the intrigue they hold for both scholars and the public. For all the interest in them, they remain almost inaccessible to the public, and little more has been learned about them since the end of Harrington's work in the late 1930s.

The Anasazi settlements form a continuous occupation along the Muddy River in the lower Moapa Valley, and were scattered along the margins of the upper valley as well, to judge from early surveys (Shutler 1961: Plates 3, 23, 24; Wheeler 1944; Schroeder 1953 a,b). The Nevada portion of the Virgin River has not been surveyed systematically, but near the Nevada-Arizona border, 19 Puebloan sites with architecture have been recorded in a four-mile reach (Jenkins 1981). Beyond these densely settled riverine enclaves, Anasazi settlements are virtually unknown in southern Nevada, although Lyneis (1981a) argued that two sites in the Las Vegas Valley, Corn Creek and Big Springs, had been unsuccessfully colonized by the Anasazi. Anasazi ceramics are more widespread, occurring in some quantity in sites in the Spring Mountains at Bird Springs (Clewlow and Wells 1980), and at Ash Meadows in Pahrump (Warren p.c. 1981). Closer by, the large proportion of Anasazi sherds observed on sites in the Mormon and Arrow Canyon Ranges suggests use of these areas for resources such as mountain sheep, agave and pine nuts to supplement the grown and gathered foods of the valley floors and margins (Rolf 1981:p.c.).

The Anasazi occupation anticipates the pioneer Mormon expansion into the Muddy and Virgin Valleys. Both of these were cultural systems which had proven successful in an adjacent region, in rather different environments. The Anasazi system was basically an adaptation to the Colorado Plateau where temperatures are cooler, summer rainfall was sufficient for crops, and the season was short. The Mormon communities were successful as long as they clung to the fringe of the Wasatch Front and the Hurricane Cliffs of Utah, but they were unable to overcome the greater difficulties of the hot desert (McCarty 1981). The Anasazi were the more successful of the two, if success can be measured by the length of time the settlements lasted: less than 10 years for the Mormon pioneers as against about 1100 for the Anasazi. Both societies were agriculturally based and had to see to their own subsistence first. Yet one wonders if the Anasazi societies were not in some measure established to produce goods for export, just as the Mormon colonies were to produce cotton. The Anasazi also grew cotton, and in addition mined salt, quarried magnesite and turquoise, and perhaps mined selenite. All of these were commodities that may

have been in demand elsewhere. In addition, the Moapa Valley settlements acquired large quantities of shell beads from coastal California, and some from the Gulf of California, indicating the widespread trade linkages of these communities (Shutler 1961:40; Lyneis 1981a).

Despite the long history of interest in this occupation and its inherent importance, its archaeology is poorly known. Several factors have contributed to that condition, including the inadequacy of the publications resulting from Harrington's extensive work, and the poor curation afforded the materials and records his work produced, frustrating the efforts of later scholars to interpret them. Kirkberg (1980) chronicles the confusion that resulted from division of the collections between several agencies and institutions, and confusion between private and public ownership of the materials. More recent work has been of limited scale, and much of it is unreported. It includes Larson's report on the Black Dog Mesa site (1978a) and Soule's reports (1975, 1976, 1979), as well as excavations at several lower Moapa Valley sites under the direction of Claude N. Warren.

The internal chronology of the Anasazi occupation remains only vaguely discerned, stymieing efforts to understand the dynamics of the settlement and demographic sequence in the valley. Although black-on-gray and black-on-white decorated pottery, one of the most time-sensitive of artifact varieties, is present, a precise local sequence has not been established. Ceramic analyses by Olson (1979) and Jenkins (1981) have resulted in the identification of some time-sensitive ceramic characteristics, but we are still only able to place assemblages within spans of several hundred years. We should, with adequately excavated collections and further study, achieve chronological control of the order of 25-50 years, as is the case elsewhere in Anasazi territory.

Research Questions. Chronological control is satisfying and essential, but it is a means, a necessary step in the development of prehistoric research, so that other questions may be explored. Among the important research questions that pertain to the Anasazi occupation are these:

1. What lessons does the abandonment of the Muddy and Virgin Valleys have for us in coming to understand the larger problem of the great Anasazi retreat of A.D. 1100-1400 over most of the northern Southwest?
2. What was the nature of the subsistence base? It was not simply a transplant of an Anasazi subsistence pattern, for we know that foods of the hot desert such as mesquite were incorporated into it, and it appears that agave was of particular importance, to judge from the frequent association of Anasazi pottery with roasting pits (see Appendix 1). What was the balance between produced and collected foods? Did it change through time? To what extent was technological innovation such as water control important?

Full exploration of the abandonment problem links several more specific research inquiries. The collapse of the Nevada Anasazi societies is not only an aspect of the large-scale abandonment of much of the Southwest, it is an approach to the study of the dynamics of the development and collapse of complex societies. It has recently been argued that the Anasazi collapse was triggered by environmental change (Euler et al. 1979), but the Moapa Valley occupation occurred in such a different environment from that of the Colorado Plateau that it seems more reasonable to explain the local collapse as a result of the failure of the socioeconomic networks that linked these communities to communities in adjacent areas. The Moapa Valley and Virgin River communities should contain important clues as to the causes of the Anasazi collapse, and why it took the form of large-scale abandonment rather than nucleation or local continuance of small communities in favored microenvironments. This research problem, and the hypothesis that socioeconomic linkage was essential to community maintenance, pose important questions about the nature of intercommunity linkage. What was the nature of the intercommunity network that resulted in the Moapa Valley and lower Virgin River settlements remaining identifiably Anasazi, and made "island" settlements, whether beyond the frontier or as surviving relict communities, non-viable? To test the alternate hypothesis, that local abandonment was caused by deficient food supplies resulting from environmental change or population build-up, we need to understand the local subsistence system and its capacity to support the population of the area. We also need to understand the internal organization of the local communities and the dynamics of change that led up to the regional abandonment. A clue to the possible importance of internal change is Jenkins' (1981) observation of apparent nucleation of Virgin River population during the final phase of occupation into communities located where irrigation was most practicable. Table 1vd-4 summarizes key research questions pertaining to the Anasazi occupation of southern Nevada.

Rock Art

Polly Schaafsma (1971) includes pictograph and petroglyph panels from southern Nevada in the division she calls Virgin Kayenta. She has thus identified the Anasazi character of some southern Nevada rock art, and has distinguished it from the Great Basin Representational Style, a very broad category within which Heizer and Baumhoff (1962) had subsumed these panels (Schaafsma 1971:117). The southern Nevada sites that Schaafsma identifies as exhibiting Virgin-Kayenta style are along or close to the drainage of the Muddy River. Three are sites in the Valley of Fire: Cl-1, Atlatl Rock; Cl-5; and Cl-145, Mouse's Tank. The other one is Cl-4 at Kane Springs on Meadow Valley Wash.

The locations of many additional rock art sites have been recorded in the course of archaeological surveys in southern Nevada in the past 20 years. Generally, the nature of these surveys has precluded thorough recording of the panels, and no regional description or synthesis has been prepared. In contrast to the Muddy River drainage, the horned or masked anthropomorphs with triangular to rectangular

Table IVd-4. Key Research Questions, Anasazi Study Unit

PROCESSES IN THE DEVELOPMENT AND COLLAPSE OF HORTICULTURAL SOCIETIES

1. Given that the Anasazi populations of the Muddy and Virgin Rivers were culturally tied to the Anasazi whose adaptive strategies were suited to the Colorado Plateau, how was the adaptation to the hot desert achieved? Were they simply an expression of the flexibility of Anasazi strategies? Or did contact with Gila-Salt or Lower Colorado peoples lead to incorporation of non-Anasazi techniques?
2. Given that the Anasazi communities of the Muddy and Virgin Rivers maintained their Anasazi cultural identity for at least 600 years, how were they linked to other Anasazi populations? Was trade an important mechanism for maintaining these linkages? What populations were they in contact with? The upland Virgin? The Kanab area peoples? Do the linkages change through time in directionality or intensity?
3. Climatic change may have triggered the abandonment of much of the Anasazi area. The stable, dependable flow of the spring-fed Muddy River makes it unlikely that the Moapa Valley was abandoned for environmental reasons. As a plausible alternative, it would seem that intercommunity relationships may have been an essential component of Anasazi society. Can we see evidence of disruption before the abandonment? Is there population reduction? Are there changes in trade and other material evidence of interaction with communities outside the lowland Virgin region? Is there evidence of change in the intersettlement relationships within the valleys? Why was the Moapa Valley abandoned when it is clear that a sizable population could have continued to sustain itself, at least to the extent that sustenance is food?

LOWLAND VIRGIN COMMUNITIES AS A FRONTIER SOCIETY

1. What was their relationship with non-horticultural societies to the west of them? Were they linked by economic exchange? Were they economically interdependent?
2. What was the role of the Muddy River settlements in long distance trade? Were they the terminus for trade from the Pacific Coast of California? To what extent were they a gateway community or middleman in trade from the Pacific into Fremont and other Western Anasazi communities?

(Table continues on the following page.)

(Table IVd-4 continued from the preceding page.)

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3. The frontier seems to have been spatially stable for at least 600 years. Were there attempts to colonize areas further west?
-

bodies which are the most distinctive design element of the western Virgin Kayenta style do not appear in panels in the Red Rocks area west of Las Vegas illustrated by Shutler and Shutler (1962). In addition, Richard Brooks observes that the rock art of Arrow Canyon just west of the upper Moapa Valley, and thus close to Anasazi settlements, "is not at all similar to the styles usually considered characteristic of the southern Great Basin" (1981:p.c.).

It is clear that the rock art of southern Nevada exhibits a great deal of temporal and areal variability. Because the Anasazi-affiliated Virgin Kayenta style is readily identifiable and its general chronological and cultural affiliations are known, it provides a fixed point from which comparative studies may be made.

Quality and Biases of Past Surveys

Unlike sites which pertain to other southern Nevada units, the settlements of the Anasazi occupance have been the object of numerous past surveys. Each differs in its geographic scope and orientation. Unfortunately, there is no existing concordance of all these surveys, and it is clear that none will be possible without a full complement of field work to check for duplicate recording of the same sites, and to determine the present condition of these sites.

In 1929 the Southwest Museum completed a reconnaissance of the lower Moapa Valley under Harrington's direction. In the 16 miles of its length Harrington identified 77 distinct sites. Briefer reconnaissance to the upper Moapa Valley led him to expect that "a proportionate number" would be discovered in its 14 mile length (Harrington 1930b:6). In comparison, he observed

The Virgin River . . . was . . . almost as intractable [as the Nevada stretch of the Colorado River] and consequently we find the ruins of permanent villages along its course only in the most favorable spots (1930b:5-6).

Harrington reported this survey in two manuscripts with an accompanying map and site sheets (Harrington 1929; 1930a). They are on file in the Southwest Museum in Los Angeles.

With the establishment of the Lake Mead National Recreation Area, much of the Anasazi portion of southern Nevada came under the jurisdiction of the National Park Service. Beginning in 1940, Gordon C. Baldwin was detailed to "learn more about the prehistory of this newly created recreation area" (Baldwin 1950:41). Most of his work was survey, and in 1946 he reported that he had recorded "430 archaeological sites about the shores of Lake Mead and along the Colorado River below Hoover Dam" (1950:41). He described his coverage of the Muddy and Virgin as "general survey" in contrast to "detailed surveys" in other portions of the recreation area.

At about the same time, S. M. Wheeler surveyed the upper and

lower Moapa Valleys. The records of his survey consist of a map and site sheets on file at the Nevada State Museum (Wheeler 1944).

Albert H. Schroeder worked in the region during some portions of his association with the National Park Service, and described a number of sites he encountered in the course of "a brief archaeological survey, undertaken in the Moapa Valley . . . in the spring of 1951 . . ." (Schroeder 1953a). Schroeder also worked with the site records for Lake Mead National Recreation Area, and had them in order by 1955 (p.c. 1980). It may be that the National Park Service maps reproduced as Plates 23 and 24 by Shutler (1961) are the result of Schroeder's synthesis, incorporating Harrington's and Baldwin's surveys.

Although Shutler undertook survey in the area of the southern Nevada Pueblo culture in 1955 and 1956, it did not involve resurvey of the lower Muddy or lower Virgin drainages. He did revisit Schroeder's sites in the upper Moapa Valley and recorded some additional ones (Shutler 1961:5).

Lysenda Kirkberg (1980) attempted a concordance of all the pre-1960 survey work in the lower valley. The effort was truncated by the lack of sufficient funding, the gremlins of confused files and multiple jurisdictions, and the impossibility of working out problems without extensive field work. Nevertheless, her compilation indicates that site densities ranged as high as 80 per square mile in the lower Moapa Valley. Two hundred sixteen sites were recorded in the lower Moapa and Virgin River Valleys. These sites fall into 11 sections, for an average density of more than 19 sites per square mile (Kirkberg 1981: p.c.).

Since 1960 additional sites have been recorded in the area, some of them as a result of cultural resource surveys such as seismic line surveys. In addition, in 1979-1980, Chick Perkins of the Lost City Museum, Overton, contributed site sheets for many of the sites known to him. As yet, they have not been reconciled with earlier site records.

During 1977-1978 Jeanne W. Clark undertook a sampling survey of the margins of the upper and lower Moapa Valley. Her data, when analysis is completed, will provide an estimate of the number of sites still extant in the upper and lower valleys, and their relative frequencies.

With the exception of Clark's recent survey all of those surveys which pertain to the Anasazi study unit were, to varying extents, selective in the area that they examined and inconsistent in what they called a site. Further, the information they contain regarding location is imprecise, and the amount of description of the sites which they include is minimal. In short, they do not come up to the standards of modern survey. That is not surprising, for they were done more than 20 years ago, but it also means that they are not a satisfactory base for management of these important sites, either within Lake Mead National Recreation Area, or

elsewhere in the Anasazi area of southern Nevada. Table 1Vd-5 summarizes the kinds of sites which may relate to the Anasazi occupancy of southern Nevada.

Management Needs

No Anasazi village sites are developed for public visitation in southern Nevada, despite their unique nature and inherent interest. A portion of one, excavated by M. R. Harrington in 1924 (Patricia Olson 1981: p.c.) and long exposed on the grounds of the Lost City Museum, has recently been enclosed. It is now well protected and forms an integrated part of the museum's displays. At the same time, the site has become a display itself, more isolated from the outdoors and the environmental setting of the valley.

The recent acquisition with Fleishman funds of several Anasazi sites on the east side of the lower Moapa Valley within 4 miles of the Lost City Museum presents the state of Nevada with a valuable opportunity to broaden the visibility and understanding of the Anasazi occupancy to residents and visitors to our state. Several of the sites are not far from existing roads. With proper exposure of living and storage rooms, pit houses and other features, portions of these sites could become open-air exhibits, linked by a road and trail guide originating at the Lost City Museum. The Nevada State Museum will be evaluating these sites and preparing a management plan for them in the coming year. The Overton area is already a focus of visitor interest, part of a triangle of attractions consisting of the Valley of Fire, Overton Arm of Lake Mead and the Lost City Museum. The steady stream of visitors to the Lost City Museum, currently estimated at about 100,000 per year, points up the strong public interest in the Anasazi archaeological remains of southern Nevada. Exposures at several stabilized sites, and perhaps continuing excavations would complement and deepen the picture of Anasazi lifeways illustrated by the displays in the Lost City Museum, and would attract much visitation.

The Mormon Colonization Study Unit describes the proximity of home sites of the Sandy Town community of Mormon pioneers of the 1860s to the Fleishman sites. With suitable development, they can jointly offer the people of southern Nevada and its visitors a unique and informative view of two very special periods of southern Nevada's past.

It is equally important that some Anasazi sites be protected in their present state for future archaeological research. Since the Anasazi settlements were situated close to farm lands they are mostly located on private land. For many years they have been vandalized by relic collectors, and it may be that all of them have suffered damage. Such vandalism, while destructive, has not yet destroyed all of the important information they contain. Excavation of several sites in the lower valley by Claude N. Warren has revealed that foundations, architectural layouts and areas of

Table IVd-5. Kinds of sites and conditions, Anasazi Study Unit.

SETTLEMENTS, CHARACTERIZED BY REMAINS OF LIVING AND STORAGE
STRUCTURES

1. These sites have been, and continue to be, vandalized. There may be no remaining unvandalized settlement sites. These illicit excavations, when carried out by hand, are usually restricted to locating rooms and digging out the center of them to loot burials of their whole vessels. The plan and room count of the settlement can still be determined by archaeological excavation, however, and cultural deposits outside the rooms are often intact. Vandalism of this scale does not render a site worthless for research. Further, any site with intact deposits that show superposition would be extremely valuable. Internal chronology for the Anasazi occupation remains poorly controlled.

FIELD PATTERNS, DIVERSION DITCHES AND OTHER HORTICULTURAL
FACILITIES

1. If there are remains of them they are buried in the flood plain alluvium of the Moapa Valley that has not been scoured to the extent that the lower Virgin has. Any exposures of them encountered in trenching or other activities should be studied and recorded, for the role of irrigation technology is an important variable in understanding the Anasazi adaptation to the hot desert valleys.

SPECIAL USE SITES

1. Open sites in agave and pinyon-juniper zones
 - a. These sites are particularly informative if they are single component sites, that is, used only in the Anasazi period.
 - b. If Southern Paiute-Mohave period sites are consistently superimposed on Anasazi special use sites, that is important information, for it reflects similarities in portions of the settlement-subsistence systems of the two societies.
2. Rockshelter and cave occupations are important if the Anasazi deposits can be separated from earlier and later occupations.

(Table continues on the following page.)

Table IVd-5 continued from the preceding page.)

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3. Roasting pits, sometimes associated with rockshelters, often show Anasazi use. Well conducted excavation with recovery and analysis of floral and faunal remains from a representative sample of them from the different environments in the several subregions would recover most of the information that this site-type has to yield.
 4. Rock art sites, particularly if
 - a. They are particularly clear panels, well suited to public viewing, or
 - b. associated with archaeological deposits, or
 - c. exhibit superposition of Anasazi motifs relative to Archaic or Southern Paiute/Mohave designs.
-

intact deposits are still present. Increasingly, however, complete destruction threatens these sites. Recently, several archaeological sites in the lower Moapa Valley have been attacked with mechanized earth-moving equipment. In addition, subdivision and construction is accelerating in the lower Moapa Valley. Homes and mobile home pads are being built among and on the Anasazi and colonial Mormon home sites. At the same time, the lower reaches of the Virgin River have become much more accessible, and subdivision and development is underway there also.

The Anasazi occupation of southern Nevada remains a primary research interest of the Department of Anthropology at the University of Nevada, Las Vegas. This interest, combined with that of the Lost City Museum provide only very limited resources for archaeological investigations. The joint capacity of the two institutions is no match for the current rate of destruction. Intensive archaeological survey of both public and private lands along the Muddy and Virgin Rivers is essential for three reasons:

1. to give us realistic estimates of the size and distribution of the Anasazi populations in the valley; and
2. to identify sites which can be protected, at least for a few years, and sites which must be excavated promptly if they are not to be lost.
3. to determine which unprotectable sites are most important to increasing our understanding, and thus should be accorded highest priority for excavation.

Table 1Vd-6 summarizes management needs for the Anasazi Study Unit.

SOUTHERN PAIUTE-MOHAVE STUDY UNIT

The area occupied by the Southern Paiute/Chemehuevi peoples at the time southern Nevada was penetrated by Euroamericans coincides generally with the Mohave Desert portion of the state (Figure 1Vd-2). At the time of contact, the Southern Paiutes apparently were the sole occupants of this region, although Yuman-speaking peoples from the south and east, including Mohave, visited the area, and the Mohaves occupied the southern-most tip of the state. The Southern Paiute and Chemehuevi were Numic speakers of closely related dialects. Kroeber (1925:593) applied the term Chemehuevi to Southern Paiute who lived in California at the end of the nineteenth century. Those Chemehuevi who lived in the Colorado River Valley had acquired a number of Mohave characteristics from the people they displaced, while the Chemehuevi of the California Desert "retained their basically Great Basin culture and remained indistinguishable on cultural grounds from their southern Paiute kinsmen" (Knack 1980:137). The term Chemehuevi is sometimes also extended to the Southern Paiutes living in southern Nevada southwest of the Moapa Valley, a usage that follows Laird (1976).

Table IVd-6. Management Needs, Anasazi Study Unit

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1. Intensive survey of private lands in the Moapa and lower Virgin to locate endangered settlements; purpose of survey to identify sites for possible protection, or for salvage excavation when destruction is imminent.
 2. Intensive survey of Federal lands, both BLM and National Recreation Area tracts, along the Muddy and Virgin Rivers to identify and evaluate sites in the public domain that can be preserved for future research.
 3. Establishment of a protected set of accessible settlement sites, interpreted to illustrate the development of Southern Nevada Anasazi culture. The Fleishman sites purchased by the Nevada State Museum can be the nucleus of an open air display, linked by a road and trail guide originating at the Lost City Museum.
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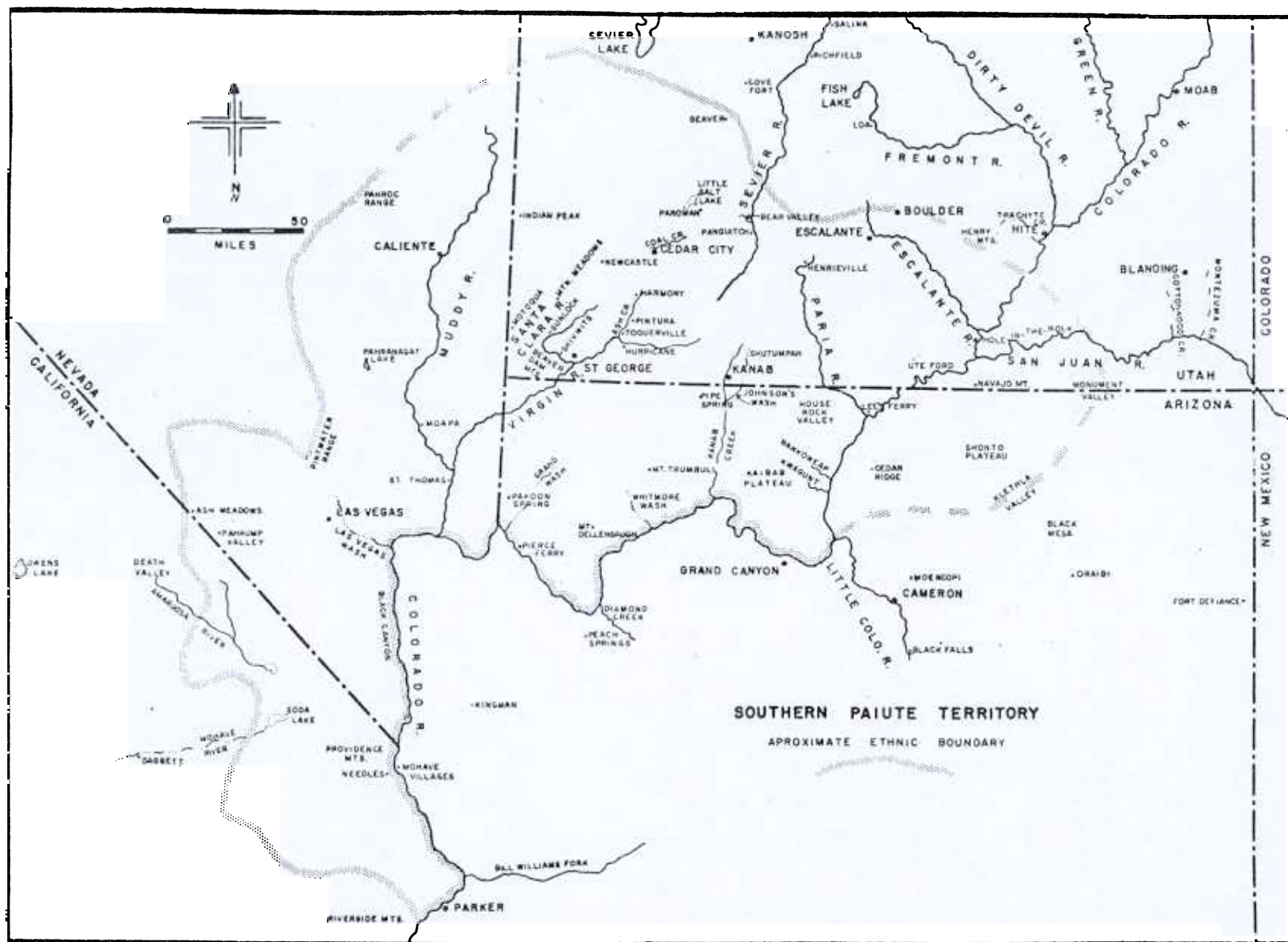


Figure IVd-2. Southern Paiute territory (Euler 1966:Figure 1).

Chester King (King and Casebier 1976:4) adopts this designation for the Paiutes of southern Nevada. Kroeber (1925:593) says that Chemehuevi is of Yuman origin, their generic term for Paiute.

The Mohave peoples were Yuman speakers and occupied a limited stretch of the Colorado River below Cottonwood Island when they were recorded ethnographically. The traditional history of the Chemehuevi records that they were originally from the Spring Mountain area, and expanded to the south at the expense of the Desert Mohave, whom they virtually exterminated (King and Casebier 1976: 17-18). This suggests that the area of southern Nevada south and west to Las Vegas changed hands during the late prehistoric period, with the Chemehuevis replacing the Mohave.

Buffware, brownware and grayware sherds, assumed to indicate the Mohave, Southern Paiute/Chemehuevi and Anasazi respectively, are found in apparent association throughout southern Nevada, leading to the interpretation that brownwares and buffwares were being made prior to A.D. 1100. Almost all the cases of association, such as Mule Springs Rockshelter (Turner 1978) and Bird Springs (Clewlow and Wells 1978), are situations where deposits were shallow or mixed and were then excavated by arbitrary levels. In these circumstances, one cannot tell whether the co-occurrence of the ceramic varieties is the result of simultaneous occupation of the region by two or three populations, or whether the remains of sequential occupations have been combined by disturbance or excavation techniques.

We know very little about the prehistoric spatial and economic relationships between the lowland Virgin Anasazi and their western neighbors. With respect to geography there are several possibilities. Perhaps the Anasazi maintained a secure and defined territorial boundary and their neighbors remained outside of it. If so, did it bound only the zone of their riverine settlements or did it also encompass upland gathering and hunting areas? What might be the boundary mechanisms by which riverine-based Anasazi could maintain territorial control of regions used only seasonally? Alternatively, the proto-Paiute and proto-Mohave populations may have been interdigitated with the Anasazi, controlling uplands adjacent to their riverine territory. In this case the societies might have been linked by exchange, each providing the other with products of the contrasting environmental zones they exploited. A third possibility is that upland areas may have been used jointly by the several peoples. The quantities of Anasazi pottery in sites in the Spring Mountains (Larson 1978b:89) indicates that if the Anasazi themselves were not there, some population with close economic ties to them certainly was.

The possibility of widespread Mohave occupance in southern Nevada, perhaps as far north as the Las Vegas Valley, has not had much affect on the interpretations that have been offered for southern Nevada (see Brooks et al. 1975, 1977; Hauck 1977). At A.D. 600, Schroeder (1979) assigned southern Nevada south of the Las Vegas Valley to the Hakataya, an archaeological culture considered ancestral to the Yuman speaking peoples including the

Mohave, however. If we accept Schroeder's interpretation, and assume that to the north of the Hakataya, areas such as the Las Vegas and Spring Mountains were inhabited by ancestors of the Southern Paiute/Chemehuevi, we have a picture of complex intercultural relations in the region A.D. 600-1100.

From his earlier work at Willow Beach, Schroeder identified a pattern of use by a group "who ranged back and forth between the Mohave Desert and the [Colorado] River" (1961:104) during the period A.D. 900-1150. He termed the pattern Amacava, a regional expression of the Hakataya, and named it with the designation first applied to the Mohaves by the Spanish. He thought that Willow Beach was the northernmost site in their range, however. It was Schroeder's interpretation that Numic speakers replaced the Mohave living in the Mohave Desert and along the stretch of the Colorado River adjacent to and south of Willow Beach at about A.D. 1150. Schroeder attributed the abandonment of Willow Beach by the Amacava to the fact that "they no longer needed to travel to the campsite at Willow Beach, because the recipients of their trade articles in the Lost City area had left their homes" (Schroeder 1961:107).

Chester King implies a pattern similar to that of Schroeder's Amacava for the Desert Mohave in eastern California. ". . . some groups began to spend most of their time in the study area, although they probably returned to the Colorado River to winter camps or during seasons when adequate food resources were not available in the desert (King and Casebier 1976:33). King suggests that the Chemehuevi were the first people to subsist entirely in the eastern Mohave, wintering in the Providence Mountains. Together, Schroeder's and King's interpretations constitute an hypothesis that a different settlement-subsistence system was an element in the replacement of the Desert Mohave by the Southern Paiute/Chemehuevi.

When the first Euroamericans reached the area, the Southern Paiute diet was derived from a variable mix of garden crops, collected foods and products of the hunt (Euler 1966:112). Gardening may have been important only to Southern Paiutes living in particularly favored locales. The Muddy River was one of these. Parley Pratt described the Paiutes encountered on the Muddy on May 29, 1854.

We saw about 150 Indians . . . at their wickeups, mere shades of poles and straw I saw also handsome gardens of beans, mellons [sic], corn, broom corn, etc arranged in beautiful rows, with little ditches for water between each row, and large ditches at proper distances (Deseret News, 4:20, July 27, 1854 as quoted by Euler 1966:66).

Earlier, in 1848, Pratt had bought green corn and beans from Paiutes on the Muddy (Euler 1966:51). Carvalho, traveling with Fremont, camped on the Muddy River within a few days of Pratt's visit, and Carvalho observed

The Indians on the Muddy River are a little higher in the scale of civilization. At one of their villages . . . I found corn and wheat under excellent cultivation the women grinding it between stones. This improved state is owing to the Mormons . . . (Euler 1966:60).

Crops included wheat and melons which spread through southwestern populations rapidly after their introduction by the Spanish, as well as corn, squash, beans, sunflowers (Kelly 1964: 39-41; King and Casebier 1976:62; Euler 1966:112-113). Some gardens were watered by small-scale ditch irrigation (Euler 1966: 111-113). The origins of the practice of horticulture by the Southern Paiute remain to be determined. There are three plausible hypotheses:

1. that it was quite recent, a manifestation of a protohistoric spread of food production that resulted from both the stimulation and disruption of native societies that accompanied the Euroamerican incursion;
2. that it was practiced prehistorically, as part of a long-term semiagricultural pattern resembling that of other peoples on the margins of the southwest;
3. that it began as early as the Anasazi period and had its origins in contact between the early Paiute and the lowland Virgin Anasazi as Euler (1966:112) suggested. In this case, if the Anasazi and the early Paiute maintained some form of exchange relationship involving upland resources for garden crops, the adoption of horticulture by the early Paiute may have been a response to the Anasazi withdrawal.

In addition to the food that they grew, the Southern Paiute drew their subsistence from the diverse plant communities of the valley and mountain terrain that they occupied. Pine nuts from the pinyon-juniper zone, a variety of agaves from the adjacent blackbrush community, rice grass from scattered microenvironments in several zones and mesquite groves in the valleys provided substantial foodstuffs. Warren (1981) points out that the distribution of mesquite in Nevada is quite similar to that of the Southern Paiutes themselves, and that the importance of mesquite in Southern Paiute diets has largely been overlooked. Further, he has pointed out that the seasonality of the mesquite harvest brings people to the watered portions of the valleys during the spring and summer, placing them in just the locations where gardens would be possible. As a result, a diet including both mesquite and garden crops would not result in major scheduling conflicts.

The ethnographic and historic records do not provide a clear indication of the nature of Southern Paiute settlements in the Mohave Desert portion of their area. We do not know if they maintained permanent winter village locations to which the same families returned each year, and if so whether they were located

in the uplands near pinenuts, or in the valleys, near gardens or mesquite groves. Warren (1981) suggests that they did have regularly reoccupied wintering locations associated with mesquite groves and gardens. We need not expect a single settlement pattern to characterize all Southern Paiute territory, however. Like other occupants of the Desert West, flexibility must have been an important component of their subsistence strategy. Different valleys provide varying balances between quantities of upland and lowland resources, and harvests of both produced and collected foods were variable from year to year.

Little of the Southern Paiute religion and ideology at contact was recorded. According to Knack (1980), Laird (1976) said that there is some indication of association of ritual with petroglyph sites, but Knack points out that like other Great Basin peoples, tribes in the Mohave Desert "denied that they themselves had manufactured them" (Knack 1980:166). Clewlow and Wells (1980:56), noting the apparent paucity of occupation residue recorded by the Shutlers (1962) in the vicinity of the extensive petroglyph displays in Red Rock, suggest that it may have functioned as a "ceremonial center".

Table 1Vd-7 summarizes key research questions for the Southern Paiute-Mohave period. Three research areas contribute importance to the remains from the Southern Paiute-Mohave Study Unit. First, sites related to this study unit are the material remains of the history and cultural heritage of Nevada's Southern Paiute/Chemehuevi populations, and so are of particular significance for their heritage values. From a methodological viewpoint, the study of the material remains from this study unit is an aspect of archaeological approaches to ethnicity, the identification and interpretation of the archaeological records of societies ancestral to a living society. Third, the semi-horticultural native of Southern Paiute/Chemehuevi makes their archaeological record an excellent situation in which to study the processes of the spread of horticulture populations among hunting and collecting societies.

Quality and Biases of Past Surveys

Like the Archaic period, this final occupance of southern Nevada has not been the object of surveys designed especially to identify sites which pertain to it. In part, it also is affected by a visibility problem similar to that of the Archaic. Although it is more recent and remains of the period have not been subject to the natural attrition of so many years of exposure, the Southern Paiute-Mohave period has suffered from relative disinterest on the part of archaeologists. The sites are not so showy as those of the Anasazi period, and they lack the intrinsic interest that comes with the greater antiquity of the Archaic period sites.

Sites of the Southern Paiute-Mohave period are encountered in cultural resource surveys. They can be assigned to this period

Table IVd-7. Key Research Questions,
Southern Paiute-Mohave Study Unit.

THE OTHER SIDE OF THE FRONTIER

1. What were the spatial, social, and economic relationships between the hunting and collecting peoples of the Mohave Desert portion of Nevada and the lowland Virgin Anasazi?

PROCESSES IN ADAPTATION TO THE MOHAVE DESERT

1. What was the role of horticulture in Southern Paiute/Chemehuevi subsistence, and how did it change through time?
2. What was the range of variability in settlement and subsistence patterns among the Southern Paiute/Chemehuevi prehistorically? Historically?
3. Can we document control of portions of southern Nevada by Desert Mohave prior to Southern Paiute/Chemehuevi expansion late in the prehistoric period? If so, what was the nature of, and range of variability in, their subsistence and settlement patterns?
4. Are there differences between the Desert Mohave and Southern Paiute/Chemehuevi settlement or subsistence systems that contributed to the ability of the Southern Paiute/Chemehuevi to replace the Desert Mohave in the non-riverine portions of the territory?

How do the Desert Mohave and Southern Paiute/Chemehuevi adaptations compare with those of the late Archaic occupations? Is there more dependence on staples, such as pine nuts or mesquite? Were the populations larger, or more nucleated?

only when they exhibit the typical projectile points of the period, or when sherds of brownware or buffware pottery are found. Southern Paiute-Mohave sites may lack both of these diagnostics because pots and points were not used or lost or broken on every site, or because they have disappeared in the interim, or because the archaeologist overlooked them during the cursory inspection possible in a cultural resources survey. These sites "disappear" into the nebulous category of lithic scatters of unknown affiliation. The kind of lithic study needed for the Archaic would also serve the needs of the Southern Paiute-Mohave Study Unit, for the process of identification of Archaic lithics would divide them from lithics of the later period. Southern Paiute-Mohave period scatters would also become identifiable, visible, contributing elements of Southern Paiute-Mohave period archaeology.

Table 1Vd-8 describes the condition of sites from the Southern Paiute-Mohave period that makes them important. Table 1Vd-9 summarizes management needs which pertain to the archaeological remains of the period.

Table IVd-8. Kinds of Sites and Conditions,
Southern Paiute-Mohave Study Unit.

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1. Large open sites. Exhibit soil modification or cultural deposits. Such sites are of great importance when the Southern Paiute-Mohave period deposits are stratigraphically separable from earlier occupations or from each other, or when the site is a single component site, an occupation in a location that was not inhabited in earlier or later times.
 2. Open sites. Large or small, with or without cultural deposit or soil modification. Sites of this variety are of particular importance when they are single component sites, that is to say, used only during the Southern Paiute-Mohave period, and are situated on surfaces or in contexts of sufficient stability to indicate that spatial patterning relating to prehistoric activities may still be present.
 3. Rock art and rock alignment sites. They are particularly valuable if there are archaeological deposits associated with them, or if they show superposition of figures, providing a sequence of representations.
 4. Rockshelters. Southern Paiute-Mohave period deposits in rockshelters are of importance if they are unmixed, that is, if they are separable from earlier and later cultural deposits. If the deposits are dry, and thus preserve artifacts and food remains that would have disappeared in open sites, they are even more valuable. Rockshelters were also used as burial places by the Southern Paiutes, with bodies interred or placed in shelters (Kelly 1964:101-102).
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Table IVd-9. Management Needs,
Southern Paiute-Mohave Study Unit.

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1. Identification of sites and locales important to the contemporary Southern Paiute/Chemehuevi and Mohave communities of Southern Nevada, and preparation of a protective plan for them.
 2. Field inventory of both upland and valley locales to identify and evaluate possible prehistoric base camp or village sites.
 3. Protection of stratified deposits and single component sites from this period.
 4. Pilot study of a selected sample of surficial sites to identify chronologically significant technologies, internal debris patterns and environmental associations, and thus evaluate the potential of these sites to contribute useful information.
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